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Political institutions and Central Bank independence: A cross-country analysis*

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Abstract. Using three quantitative measures of Central Bank independence, we apply OLS and TSLS regression methods to investigate the possible correlation between political liberty, political instability and central bank independence. For a sample of Western democracies and highly democratic developing countries we show that Cukierman's legal independence index is positively correlated with political freedom and regime political stability. It is negatively correlated with party political stability. For a sample of developing countries that excludes dictatorships we show that a special index of legal central bank autonomy is positively associated with political freedom and political stability. Finally, we observe that, for the same sample of nations, the turnover index of central bank independence is not sensitive to our political variables.

1. Introduction

In recent years economists have shown an increasing interest in how political and social institutions affect monetary policy and performance. Numerous studies have demonstrated a clear link between political and monetary instability.[1] The recognition of this link has encouraged other economists to examine the impact of political factors on the behavior of institutions that influence monetary policy. The most important among these institutions are the central banks, which play an increasing role in economic-stabilization efforts.[2]

To date, the research on this topic is very limited. The two most prominent contributions, Cukierman(1992) and De Haan and Siermann (1996), have examined the impact of various kinds of political instability on the independence of central banks. Other studies focusing on the same issue often ignored the importance of political factors. These investigations are confined

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to Western economies which operate within a democratic framework of relative political stability. These studies are reviewed in Eijffinger and De Haan (1996).

The objective of this study is to investigate the impact of political institutions on the independence of central banks, based on comparative analysis of cross-country data. We consider political stability and political freedom as the main factors defining the political character of a country. By showing how political institutions can affect the independence of a central bank, we hope to provide a better understanding of how monetary policy in economies in transition can be affected by the nature of political changes and reforms.

Our study differs from previous efforts in three important aspects. First, in addition to the political instability affecting the conduct of the central bank, we also consider the impact of political liberty. As Posen (1995) has shown, the activities of anti-inflationary pressure groups (e.g., the financial sector) have played a significant role in promoting central bank independence. Since the formation and effectiveness of political pressure groups depend to a large extent on the level of democracy of a regime, we can infer that there is some linkage between the degree of political freedom and the independence of a central bank. Second, rather than following Cukierman (1992) and De Haan and Siermann (1996) who use very narrow measures defining political instability, we adopt a different measurement through the use of comprehensive indexes which involve a larger number of political variables. Third, since the weakness of the tax collection system increases the reliance upon the inflation tax in many developing countries, we put an emphasis on the relationship between the size of the tax revenue and independence of the central bank.

The paper proceeds as follows. Section 2 briefly reviews the recent literature. Section 3 presents the theoretical arguments regarding the impact of political and economic institutions on the independence of central banks in developing countries. In Section 4, the reader will find model specification along with the discussion of data and methodology. The analysis of empirical results will be presented in Section 5 followed by the summary and conclusion in Section 6.

2. Review of the literature

Existing literature on the impact of political factors affecting central bank independence (CBI) is primarily limited to political instability. No standardized definition of the term “political instability” has been used in empirical studies. Cukierman’s study (1994), for instance, investigated the impact of two types of political instability: (a) party political instability and (b) regime political instability. *Party political instability* (PPI) refers to the frequent

change of government between competing political parties such as left wing and right wing, within a political regime. When the PPI is high the ruling party realizes that it could easily lose power in the next election. Fearing that the opposition party might use the monetary policy to monetize budget deficits, the ruling politicians prefer to delegate the power over monetary policy to an independent body (central bank). Hence, Cukierman hypothesizes a positive correlation between PPI and central bank independence.

The *regime political instability* (RPI) measures the frequency of irregular changes of political regime such as revolution, coup d'etat, etc. Under high degrees of RPI a ruling regime is foremost preoccupied with its short term survival. The regime, therefore, has an incentive to use a flexible monetary policy to accommodate its tax and fiscal policies. For such a regime, subordination and flexibility of monetary authorities are more important than credibility of monetary policy. Cukierman, therefore, hypothesizes that RPI has a negative effect on central bank independence. Using quantitative indexes of PPI and RPI constructed by Haggard, Kaufman, Sharif and Webb (1991) for fourteen middle income nations, Cukierman (1992) demonstrates that, as expected, party political instability has a positive correlation and regime political instability has a negative correlation with central bank independence.

In a similar study, De Haan and Siermann (1996) use the number of regular (change of political party) and irregular (coup) government changes as proxies for political instability. Based on data for 43 developing countries, they find a negative relation between irregular government change and central bank independence. In another study, De Haan and Van't Hag (1995) regress several measures of central bank independence for 21 industrial countries on the frequency of government changes from one party to another with significant ideological difference. They find that party political instability does not have a significant impact on CBI. Finally, Cukierman and Webb (1995) compare the probability of a central bank governor being replaced after a regular and an irregular change of government. They find that the probability of replacement after an irregular change of regime (a coup or revolution) is much higher than a regular transfer of power.

3. Political setting and Central Bank independence

In many of the economies in transition, the nature and magnitude of the independence of a central bank are greatly influenced by the extent to which the government in power is relying upon the effectiveness of the central bank for monetary stabilization. We argue that, under a given set of political conditions, the degree of central bank independence chosen by a government generally depends on two considerations:

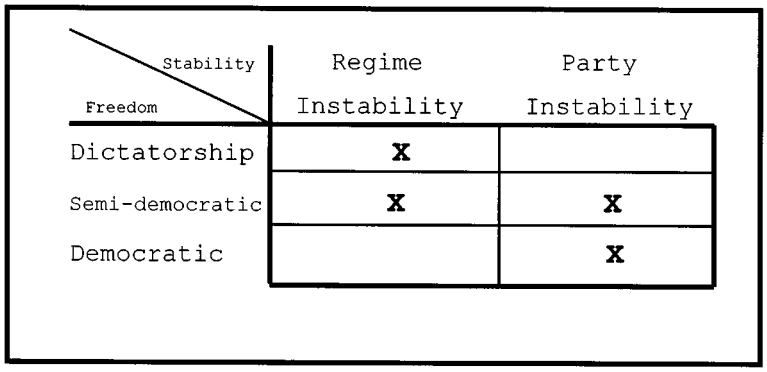

Figure 1. Political regime types and political stability.

(a) the relative importance of monetary stability and monetary expansion (inflation tax revenue) as two conflicting economic goals for a government; and

(b) whether monetary stability, if desired, could be achieved without increasing the autonomy of the central bank.

A government will give some degree of independence to a central bank if, first of all, that government considers monetary stability to be its priority. As a second condition for CBI, the government must believe that a central bank's autonomy is the only way to achieve such a stabilization goal. These considerations depend not only on the existing economic conditions but also on the political characteristics of that country. The political factors that we are concerned with in this study are political liberty and political stability. The different combinations of liberty and stability that could exist in a country are shown in Figure 1. Following Cukierman's (1994) analysis we differentiate between regime and party political instability as was noted above.

Under a dictatorial regime, the question of central bank independence is rather irrelevant. Since, in a dictatorship, there is no real separation of powers and no constitutional guarantee for the rule of law, even the nominal independence of the central bank in the legal system is meaningless. This point is important because many developing countries imitate the financial laws of the Western industrial countries for the sake of prestige and international approval. Furthermore, a dictatorial regime can oppress the pro-spending social groups and establish monetary stability without an independent central bank.[3]

In a semi-democratic country which is undergoing a democratic transition, the presence of both regime and party instability is possible. During the transition period some democratic institutions germinate but at the same

time there is a real possibility that certain powerful pressure groups (e.g., the armed forces) might undermine the democratic process. This political instability along with the potential for monetary instability is harmful to investment and economic growth. At this stage, central bank independence could act as a precommitment device and increase public confidence in monetary policy. Hence, the financial sector and some business leaders will support more central bank independence. However, as explained below, the political pressure for monetary expansion in democratizing countries is stronger and will prevent any increase in the central bank autonomy until later stages of democratization.

The reasons for deterioration of monetary stability in early stages of democratization are as follows. As a country enters into a democratic transition stage, the low income social groups will use their newly gained political power to press for increased social expenditures. Evidence for this political behavior and its economic consequences is provided in many empirical studies. Analyzing budgetary allocations in four industrial countries over a period of one hundred years, Hage, Hanneman, and Gargan (1989) demonstrate a positive statistical relation over time between rising power of the working class, the rising per capita income and the increasing provision of health, education, and welfare programs by these governments. Similarly, Meltzer and Richard (1983) explain the impact of democratic reform on government expenditures by arguing that the lower income groups have an incentive to support more spending after they gain the right to vote. As a result, as more and more social groups gain the right to political participation, the government expenditure in welfare and social programs, and consequently the share of government expenditures in GDP will increase.

Governments can finance the increased expenditure by a) raising more taxes, b) borrowing from the public and c) borrowing from the central bank. However, because of the existing instability and the inefficiencies of the financial markets, it becomes increasingly difficult for the government to borrow from the public. Therefore, the government must rely either on more taxes or on monetary expansion to finance the new expenditures. Developing countries suffer from various degrees of tax evasion and inefficient tax management (Burgess and Stern, 1993). In countries that the tax system is more efficient and the ratio of taxes to GDP is larger, budget deficits will be smaller and there will be less need for a dependent central bank to monetize the debt. Hence, we hypothesize a positive relationship between the tax revenues, as a percent of GDP, and the central bank autonomy. Furthermore, in semi-democratic countries, we hypothesize a negative relationship between central bank independence and regime instability.

As the democratic institutions take root and independent political institutions gain more strength, the financial sector emerges as an independent interest group with strong anti-inflationary orientation (Posen, 1993). Usually this interest group supports one of the major parties (e.g., the Republican Party in the United States), while the pro-spending, pro-job creation interest groups dominate the other party. Finally, as a democracy reaches to the highest stage of maturity, the direction of monetary policy in general and central bank independence in particular, will depend on the balance of political power between the pro-stability and pro-spending interest groups.

The only type of instability observed in a mature democracy is party political instability where political power moves back and forth between leading political parties with different economic ideologies. As described in Cukierman (1994) the party that supports monetary stability, when in office, is worried about the possibility of monetary expansion by the pro-spending party, if and when it gains control of the government. Hence, when the party political instability is high, the pro-stability party will try to insulate monetary policy against executive and legislative political pressure by delegating authority over it to an independent central bank. Therefore, we hypothesize a positive relationship between party political instability and central bank independence in mature democracies and in countries in the final stages of democratic reform.

4. Statistical model and data

In order to test our hypotheses, we regress various indexes of central bank independence on quantitative indices of political liberty and political stability. The regression models basically include three distinct categories of independent variables. We formulate the regression model as:

CBI = f(political institutions, Tax/GDP ratio for explicit taxes, government's deficit financing policy).

The dependent variable: Three quantitative measures of central bank independence are used for the dependent variables. Two were recently developed by Cukierman, Webb and Neyapti (1992). We introduce a third. These indices are:

1) *The Cukierman, Webb, Neyapti (CWN) Legal Index*: This is a composite index of legal central bank independence hereafter referred to as CWN index. The CWN index covers 72 nations. It accounts for a large number of legal factors that affect the autonomy of central banks.[4] As demonstrated in Cukierman et al. (1992), this index offers a far better measurement of central bank independence as compared to earlier indices. Furthermore, they show

that, for industrial nations, its correlation with measures of monetary performance is statistically significant. The CWN index and an unweighted average of its components have been used in several recent empirical studies of CBI, primarily because the scope of all other indexes is limited to the industrial nations.[5]

2) *The turnover index*: This is an index of the turnover of the central bank governor. It indicates how frequently the governor of a central bank is replaced. The turnover index is an indirect index of central bank independence. Cukierman, et al. (1992) argue that in developing countries legal independence might not be an accurate measure of actual central bank independence. Their regression analysis does not show a significant correlation between (CWN) Legal index and the inflation rate in developing countries. Instead, they claim that frequency of change of central bank governor shows how independent the central bank actually is. The fast turnover of the central bank governor in a country is viewed by Cukierman, et al. as a sign of central bank dependency. The turnover is high because as soon as a central bank governor opposes the policy dictates of the president, he is replaced by a more obedient person. Cukierman (1992) compares the turnover index for industrial and developing nations (average turnover during 1950–1989) and shows that for industrial nations the average is significantly smaller.

3) *The Less Developed Countries (LDC) Legal Independence Index*: This is a narrow index of legal central bank independence (hereafter referred to as the LDC index,) which is more suitable for measurement of CBI in developing countries (LDCs) than the CWN index. We construct this index as the average of three of the seventeen parameters that were originally used by Cukierman et al. (1992), for construction of the CWN index. Banaian, Burdekin, and Willett (1998) have shown that out of the seventeen parameters used by Cukierman, only three had a negative and significant correlation with the inflation rate in developing countries: 1) the term of office of the Central Bank Governor; 2) the provisions for conflict resolution; and 3) the type of limits on lending procedures from the central bank to the government. These are the three factors that we use to calculate the LDC Index. In the empirical analysis section of this article, we will also demonstrate that the turnover index and the LDC index are more relevant for monetary stability in developing countries than the CWN index.

In our regression analysis we use the ten-year average of the CWN legal independence index as reported by Cukierman et al. (1992) for the period 1980–89. The sample includes 20 industrial and 52 developing countries listed in the appendix. This index varies between 0 and 1. A larger value indicates a higher level of independence. The LDC legal index is also the ten-year average for the same period and has the same range. The turnover index is

calculated by dividing the total number of changes of central bank governors in each country by ten to obtain the average annual turnover rate for the same decade (1980–89). A high value of this index for a country is viewed as an indication of less central bank independence.

Independent variables:
a) *Indices of political freedom and political stability*. For measurement of freedom we use Gastil's index of political liberty. This index is calculated annually for most nations and is reported in the January issue of Freedom at Issue.[6] The range of this index varies between one and seven. A highly democratic society receives a score of one while a repressive dictatorship is ranked seven. We use the ten year average of this index for the period 1980–89.

We utilize two different measures of political instability. First, the Index of Regime Instability is constructed as the average of an index of revolution and coup, and an index of assassination. Both of these indices are reported in Barro (1991). We use the ten-year average of this index (1980–89) as a measure of the regime political instability. Second, the Political Risk Index is calculated by the Political Services International as part of their comprehensive publication known as International Country Risk Guide (ICRG).

The Political Risk Index ranges between 0 and 100. A higher score indicates a higher level of political stability. Since ICRG annual data are proprietary data, we obtained the five-year average of political risk index (1985–89) from Erb, Harvey and Viskanta (1996).[7] Unfortunately the data for this variable for the earlier years are not available. However, since political conditions for most countries during the 1980s changed rather slowly, we consider the 1985–89 average of political risk index as a close proxy for the 1980–89 average[8].

The political Risk Index is a weighted average of 13 political factors that have a significant impact on political stability. Many of these parameters are intended to measure regime political instability such as: frequency of coups and revolutions, potential for civil war, frequency of political assassination and political power of the military. In stable democracies the values of these indicators are small or near zero.

The political Risk Index also includes factors that capture the types of political instability that could arise within a well functioning democratic framework. The most important among these factors is the indicator of political culture within and among political parties which is highly similar to the Index of Party Political Instability that was used by Cukierman (1994). Therefore, we expect the Political Risk Index and the Party Political Instability Index to be highly correlated for the democratic countries. In less democratic countries we expect the Political Risk Index and the Regime Political

Instability Index to be highly correlated. In our sample, for Western democracies, the correlation between Political Risk Index and Regime Political Instability Index is –0.11. For less democratic developing countries that are not under full dictatorship, it has a much larger value, –0.52.

b) Tax ratio. This is the ratio of tax revenue to GDP of each country. We use two indicators of tax effort: (a) total tax revenue as a percent of GDP; (b) income tax revenue as a percent of GDP. The averages of these two ratios are calculated from the data shown in Table 2 of Burgess and Stern (1993). We hypothesize that there exists a positive relationship between these tax variables and the CWN and LDC indices of legal independence, and a negative relationship with the turnover index.

c) Indicator of reliance on inflation tax and deficit monetization. We use the funds borrowed from monetary authorities as a percent of domestic financing, as our indicator of deficit monetization. The data for this variable were obtained from the International Monetary Fund's Government Finance Statistics Yearbook. In a recent empirical study Sikken and DeHaan (1998) have demonstrated that, in developing countries, more central bank independence reduces deficit monetization. We believe that the causal relation between monetization and CBI runs both ways. At the same time that CBI affects monetization, the desire of a government to monetize the deficit will affect her attitude towards central bank independence. Governments that are more dependent on monetization will grant less independence to their central banks. Because of this two way causality, we treat the indicator of deficit monetization as endogenous and apply the two stage least squares method.

5. Regression results

The results of our regression analysis are summarized in Tables 1, 2 and 3. We will discuss the results for the three indices of central bank independence separately.

(a) Legal independence of Central Bank. The data in Table 1 show the correlates of the legal central bank autonomy (CWN index) based on ordinary least squares regressions. The sample of observations used for these regressions is limited to democratic and semi-democratic countries in their late stages of democratization. In regression models 1 and 2 Political Risk Index is used as an indicator of party political risk. As mentioned earlier, for the highly democratic countries as a group, the regime political instability is very low. Hence, the differences in value of Political Risk Index reflects differences in party political instability. On the other hand, the sample observations for these regressions cover some democratizing developing countries that might still be experiencing some regime political instability. Therefore, in addition to

the Political Risk Index, the index of regime political instability (which only measures coup, revolution and assassination,) is also included in the model.

The values of the adjusted R^2 and the F statistics for each model in Table 1 indicate that the proposed equations have good explanatory power for the CWN index. The sample of observations for model 3, denoted by C, has a larger number of developing countries than model 2, which has a larger number than model 1. Consequently, the additional countries in sample C are less democratic than the ones in sample B, which are less than those in sample A.

The index of political liberty has a significant coefficient with the expected sign in the second and third models. (Since the sample observations of the first model are limited to highly democratic nations, the index of political liberty does not have enough variation to give a significant coefficient.) This means that higher levels of political repression are associated with lower levels of legal central bank independence. The index of regime political instability has the expected negative sign in all regressions: higher levels of regime political instability are associated with lower levels of legal independence.

The Political Risk Index (which is an indicator of party political instability for mature democracies and regime political instability for less democratic ones), has the expected negative sign. Based on Cukierman's (1994) hypothesis, we expect higher levels of party political stability to be linked with lower levels of central bank independence. The negative sign of Political Risk Index confirms this hypothesis. As we noted above, the differentiation between regime and party political stability is more meaningful for highly democratic nations. Our data confirm this conjecture: as we enlarge the sample size by adding a larger number of less democratic countries (sample C in model 3), the correlation between the two political instability indices increases and the coefficient of one of them becomes insignificant. In other words, Political Risk Index in sample C (which includes less democratic nations,) captures a great deal of variations of the regime political instability.

The only independent variable that does not carry the expected coefficient sign is the ratio of tax revenue to GDP. However, the coefficient of this variable is statistically insignificant in all of regressions. Perhaps this outcome is due to the fact that more than 60 percent of the observations used in these regressions are from industrial nations in which financial markets are more efficient and deficit monetization is minimal. Thus, the tax revenue constraint does not constitute an important determinant of central bank independence.

Table 2 shows the correlates of the LDC index. Banaian et al. (1998) have used principal component analysis to show that the three components of this index are the most relevant measures of legal central bank independence for

Table 1. Correlates of legal Central Bank independence

	Dependent variable CWN index of legal independence		
	(Sample of obs. limited to democratic and semi-democratic countries only.)		
Independent variables	Model (1)	Model (2)	Model (3)
Inverse Index of Political	–0.027	–0.09	–0.05
Liberty (V1).	(0.75)	(0.03)	(0.03)
Index of Regime Political	–0.03	–0.03	–0.018
Instability (V2).	(0.08)	(0.05)	(0.22)
Political Risk Index (V3)	–0.004	–0.004	–0.003
	(0.09)	(0.05)	(0.09)
Tax Revenues as % of GDP	–0.002	–0.001	–0.002
(V4)	(0.24)	(0.37)	(0.33)
Dummy variable for Germany,	0.3	0.31	0.31
Switzerland and Austria*	(0.0001)	(0.00)	(0.0001)
Constant	0.78	0.84	0.71
	(0.004)	(0.001)	(0.001)
No. of observations	27.0	33.0	39.0
Adjusted R-squared	0.51	0.52	0.43
F-statistic	6.59	8.09	6.81
Prob. of F-stat.	(0.0007)	(0.00009)	(0.0001)
Sample restriction	Sample A	Sample B	Sample C

Note: Regressions were estimated by the Ordinary Least Squares method. All three models were tested for Heteroskedasticity. The critical value of T-Statistics are given in Parentheses.

*The index of legal central bank for these three countries was much higher than others and introduction of this dummy variable significantly increased the quality of regressions.

Sample A is limited to those countries for which the Gastil's inverse index of political liberty was less than or equal to two.

Sample B is limited to those countries for which the Gastil's inverse index of political liberty was less than or equal to three.

Sample C is limited to those countries for which the Gastil's inverse index of political liberty was less than or equal to four.

Correlation coefficients for the independent variables, (Sample A), are:
(V1,V2) = 0.03, (V1,V3) = –0.40, (V1,V4) = –0.05, (V2,V3) = –0.23, (V2,V4) = 0.005, (V3,V4) = 0.14.

developing countries. Our data confirm that conclusion when the inflation rate is regressed on the CWN, LDC and turnover indices in Equation 1.

$$\begin{array}{l} D = -0.66\,\mathrm{LDC} + 0.44\,\mathrm{CWN} + 0.36\,\mathrm{Turnover} - 0.004\,\mathrm{PolRisk} + 0.31 \\ \qquad (0.011) \qquad (0.15) \qquad (0.009) \qquad (0.01) \qquad (0.01) \\ \text{Adjusted } R^2 = 0.41 \;\; N = 30 \;\; F - \text{stat} = 6.16\,(0.001) \end{array} \tag{1}$$

Sample is limited to developing countries only. D= Inflation/(1-Inflation); the transformed inflation rate as reported in Cukierman et al. (1992), LDC = Index of legal CBI for developing countries, CWN = Cukierman, Webb and Neyapti index of CBI, PolRisk = Political Risk Index, Turnover = the rate of turnover of the central bank governor. The critical probabilities of the T-statistics appear in parentheses.

While the LDC and the turnover indices have significant coefficients, the coefficient of the CWN index is rather insignificant. This implies that the CWN index is not a determinant of inflation in developing countries. As we had expected, a higher rate of turnover leads to more inflation while a higher level of LDC index will diminish it.

In Table 2, the sample of observations we use to estimate models 4, 5, and 6 is limited to those developing countries that are not experiencing full dictatorships. Specifically, it excludes countries with a score of five or higher in Gastil's inverse index of political liberty. The political instability of these countries is more of a regime instability than a party instability. Therefore, the Political Risk Index reflects regime political instability for developing countries and as was mentioned earlier, it is highly correlated with the Regime Political Instability Index.

Thus, in the sample of developing countries, regressing the LDC legal index on more than one stability index leads to a multicollinearity problem. To avoid this problem, we estimate the coefficient of each stability index in a separate regression. Furthermore, to avoid heteroskedasticity problems in models 4, 5, and 6, we rely on the weighted least squares technique. We use one over Gastil's index of political liberty as the weight for each observation. This will give more weight to the more democratic countries in our sample. The quality of regressions as shown by Adjusted R^2 and F-statistics is acceptable.

Models 4 and 5 in Table 2 show that there is a positive correlation between political stability and LDC index of Legal CBI in developing countries. The coefficient of the Political Risk Index has the expected (hypothesized) positive sign. The index of regime political instability has the expected negative sign, but it is not statistically significant. Overall, these results are in line with the earlier findings of De Haan and Siermann (1996), who find that a negative correlation exists between irregular political change and central bank independence. In model 6 we find a negative correlation between polit-

Table 2. Correlates of the index of legal central bank independence for developing countries.

	Dependent variable The LDC index of legal independence		
	(Sample of obs. limited to democratic and semi-democratic developing countries only.)*		
Independent variables	Model (4)	Model (5)	Model (6)
Political risk index (V1)	0.009		
	(0.04)		
Index of regime political		–0.026	
instability (V2)		(0.45)	
Inverse index of political			–0.07
liberty (V3)			(0.09)
Income tax revenue as	0.007	0.01	0.01
% of GDP (V4)	(0.3)	(0.11)	(0.1)
Constant	–0.23	0.29	0.43
	(0.36)	(0.001)	(0.00)
No. of observations	18.0	19.0	21.0
Adjusted R-squared	0.78	0.72	0.76
F-statistic	31.7	25.03	33.6
Prob. of F-stat.	(0.00)	(0.00001)	(0.0001)

Note: Regressions were estimated by the Weighted Least Squares method to correct for heteroskedastisity. One over Gastil's index of political liberty was used as the weight for all regressions. The critical probability value of T-Statistics are given in parentheses.
*Only those developing countries with a score less than 5 on Gastil's inverse index of political liberty are included in the sample.
Correlation coefficients for the independent variables are:
(V1,V4) = 0.38, (V2,V4) = –0.15, (V3,V4) = –0.23).

ical oppression and the LDC index; this confirms our hypothesis that central banks enjoy more independence in more democratic developing countries. Finally, we find a positive coefficient value for the ratio of income tax to GDP in all three regressions although its level of significance is only 10 percent. Those developing countries with a more effective tax collection system are likely to have central banks with greater independence.

Correlates of the turnover index: Correlates of the turnover index of CBI are given in Table 3. The sample of observations is limited to developing countries but excludes the highly dictatorial nations for which the notion of CBI is meaningless. Since a higher rate of turnover represents a lower level of CBI

we expect a negative coefficient for the Political Risk Index, which measures political stability, and a positive coefficient for the index of regime political instability. Contrary to our expectation, in equations 7 to 9 we observe that the index of political liberty and the two indices of political instability have insignificant coefficients. Furthermore, the ratio of taxes to GDP is also insignificant. The only variable that is significant is the deficit monetization index that has a positive sign as it was hypothesized.

The model is fairly robust with respect to alternative specifications. Repeating the regressions with alternative functional forms we arrive at the same results. However, while our models are unable to demonstrate a direct correlation between political instability and the Turnover index, there might be an indirect linkage through the deficit monetization variable. As explained before, higher levels of instability lead to larger deficits and hence, more deficit monetization by the central banks.

Political stability and tax effort are not significantly correlated with the turnover index. Yet they are significantly correlated with the LDC index of CBI. It is important to note that the Turnover and the LDC indices affect the rate of inflation in developing countries; therefore, they could be considered as reliable measures of CBI for these nations. The statistical correlation between these variables is 0.01 which implies essentially no correlation at all. These two indices measure two different things. Only one of them is directly influenced by the level of political instability and political freedom. The results of Tables 2 and 3 lead us to conclude that higher levels of political stability and political liberty are significantly linked with the higher levels of CBI in developing countries.

6. Summary and conclusion

In this study we use three indexes of central bank independence to analyze the impact of political factors on central bank autonomy in industrial and developing economies. Using a set of composite indexes for political freedom and political stability, we obtain the following results from our regression analysis. From a sample of developing countries in various stages of democratic transition, our analysis leads us to conclude that the relevant index of legal central bank independence has a positive correlation with political freedom as well as political stability. Furthermore, legal central bank independence reaches a relatively higher level in developing countries where tax revenues are effectively collected. For both the Western democracies and the developing countries in advanced stages of democratization, party political instability often leads to higher levels of independence of the central bank while regime political instability creates the opposite effect.

Table 3. Correlates of the turnover rate of Central Bank Governor in developing countries (1980–1989)

	Dependent variable: The turnover index (log)		
Independent variables	Model (7)	Model (8)	Model (9)
Inverse index of Political liberty (V1)	–0.05 (0.51)		
Index of regime political instability (V2)		–0.06 (0.30)	
Political risk index (V3)			0.018 (0.15)
Total taxes as % of GDP (V4)	–0.017 (0.31)	–0.01 (0.32)	–0.01 (0.33)
Credit borrowed from monetary authorities as a ratio of domestic financing	0.79 (0.014)	0.61 (0.03)	0.92 (0.03)
Dummy variable for Argentina	1.16 (0.001)	1.15 (0.0009)	0.98 (0.022)
Constant	–1.22 (0.001)	–1.42 (0.004)	–2.49 (0.001)
No. of observations	23.0	23.0	24.0
F-statistic	5.98	7.22	4.33
Prob (F-statistic)	(0.003)	(0.0001)	(0.011)

Note: Method of two stage least squares was used in estimation of these regression models. Credit borrowed from monetary authorities as a ratio of domestic financing is regarded as endogenous. The instruments used for estimation of this variable are: industrial output as a ratio of GDP, Total tax revenue as % of GDP, Inverse index of political liberty, index of regime political instability country credit risk index and the index of political risk. The numbers inside the parentheses are the critical probabilities of T-statistics. Sample of observations is limited to the developing countries with a score smaller than six in Gastil's index of political liberty.
Correlation coefficients for the independent variables are:
(V1,V4) = –0.19, (V2,V4) = –0.33, (V3,V4) = 0.37.

The regression results for the turnover index show that this measurement is not sensitive to either political freedom or political stability. It remains insensitive also to the ratio of tax revenue to GDP. The only variable that has a significant relationship with the turnover index is the portion of the budget deficit that has been monetized by the central bank. The monetization of public debt may be attributed to the political instability of the country. As

we had expected, in countries with a higher rate of monetization of the budget deficit, the turnover rate of the head of the central bank is relatively higher.

Notes

1. Edwards and Tabellini (1991) provide a comprehensive review of literature on this issue.
2. For a review of empirical and technical arguments in support of central bank independence as an institutional device for monetary stability see Fischer (1995). Arguments against central bank independence are reviewed in Bowels and White (1994).
3. For a survey of different views on the ability of dictatorships to resist rent-seeking pressures by various interest groups see Skalnes (1993).
4. The CWN index is a weighted average of seventeen variables which address a) the terms of appointment and dismissal of the director of the central bank, b) role of the central bank in formulation of monetary policy, c) objectives of the central bank, and d) obligations of the central bank towards the financial needs of government. We have analyzed the first three categories.
5. The other measures of central bank independence are constructed by Alesina (1988), Grilli, Masciandaro and Tabellini (1991) and Eijfinger and Schaling (1993, 1995). These indexes are measured for industrial countries. Eijffinger and De Haan (1996, p. 28) calculate the correlation of these and Cukierman indexes for a set of common nations. They show that these indexes have relatively low correlation.
6. Gastil's index is one of several political rank indicators. In recent economic literature this index has been used more than others. For an evaluation of the positive and negative aspects of these rankings see Bollen (1986).
7. The Electronic version of Erb et al. (1996) is available at the following web site: WWW. Duke.edu/ charvey/Country_risk/ We obtained the multi-year average of the political risk index from this electronic version.
8. Searching for alternative indices of political instability, for which data is available for 1980–89 period, we also considered the Country Credit Rating Index (CCRI). This Index is calculated by International Investor Corporation as a composite index measuring economic, political, and financial risk for each country. The correlation between CCRI and political risk index for our sample of nations was 0.6. When replacing this index for the political risk index in our regression models the estimation results did not change.

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Appendix

Names of countries included in the data set

1) Democratic countries (countries with score of 1 in Gastil's Index of Political Liberty): Australia, Austria, Barbados, Belgium, Canada, Costa Rica, Denmark, France, Germany (former West), Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Sweden, Switzerland, The UK, The USA, Venezuela.
2) Semi-democratic countries with strong democratic institutions(1<Gastil's Index <= 3): Bahamas, Bolivia, Botswana, Brazil, Colombia, Finland, Greece, Honduras, India, Israel, Malta, Peru, Portugal, Spain, Thailand.
3) Semi-Democratic Countries with weak democratic institutions (3< Gastil's Index <=5.5): Argentina, Egypt, Hungry, South Korea, Lebanon, Malaysia, Mexico, Morocco, Nepal, Nicaragua, Nigeria, Pakistan, Panama, Philippines, Poland, Qatar, Singapore, South Africa, Taiwan, Turkey, Uganda, Uruguay, West Samoa, Zambia, Zimbabwe.
4) Non-democratic Countries (5.5< Gastil's Index): Chile, China, Ethiopia, Ghana, Kenya, Romania, Tanzania, Yugoslavia, Zaire.

Note: The Gastil's average index of political liberty represents the status of these countries during 1980s. The political conditions in many countries have changed ever since.